HECLA MINING COMPANY-LUCKY FRIDAY (PWSNO 1400028)
SOURCE WATER ASSESSMENT REPORT

October 18, 2001

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the watershed characteristics.

This report, *Source Water Assessment for HECLA MINING COMPANY-LUCKY FRIDAY* describes the public drinking water system, the zone of water contribution, and the associated potential contaminant sources located within these boundaries. Taken into account with local knowledge and concerns, this assessment should be used as a planning tool to develop and implement appropriate protection measures for this source. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The Hecla Mining Company-Lucky Friday drinking water system consists of surface water intakes in the West and Middle Forks of Deadman Creek and in intake in the National Tunnel adit. Naturally occurring microbial contamination is the greatest threat to water quality at Lucky Friday. Although there are several inactive mines in the Deadman Creek drainage, the water sources are ranked at low risk for inorganic chemical contamination based on water sampling history and information from the Interior Columbia Basin Ecosystem Management Project *(ICBEMP) Mining Related Hazard Potential* database. Antimony was detected in the water in concentrations well below the Maximum Contaminant Level (MCL) during routine testing in 1998 and 1999. Radionuclides below MCL were detected in 1994 and 1998. Synthetic organic chemicals and volatile organic chemicals have never been detected in routine water tests and there are no documented potential sources of those contaminants in the watershed.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For the Hecla Mining Company-Lucky Friday drinking water system, source water protection activities should focus on preventing sediment flow into Deadman Creek and the National Tunnel intakes. Due to the fairly short time associated with the movement of surface waters, source water protection activities should be aimed at short-term management strategies with the development of long-term management strategies to counter any future contamination threats. Source water protection activities should be coordinated with the appropriate public land management agencies and private landowners in the Deadman Creek watershed.

A community with a fully developed source water protection program will incorporate many strategies. For assistance in developing protection strategies please contact your regional IDEQ office or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR HECLA MINING COMPANY, LUCKY FRIDAY, MULLAN, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area, map showing the entire watershed contributing to the delineated area, map showing the twenty-four (24) hour emergency response delineation, and the inventory of significant potential sources of contamination identified within the delineated area are attached. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is attached.

Background

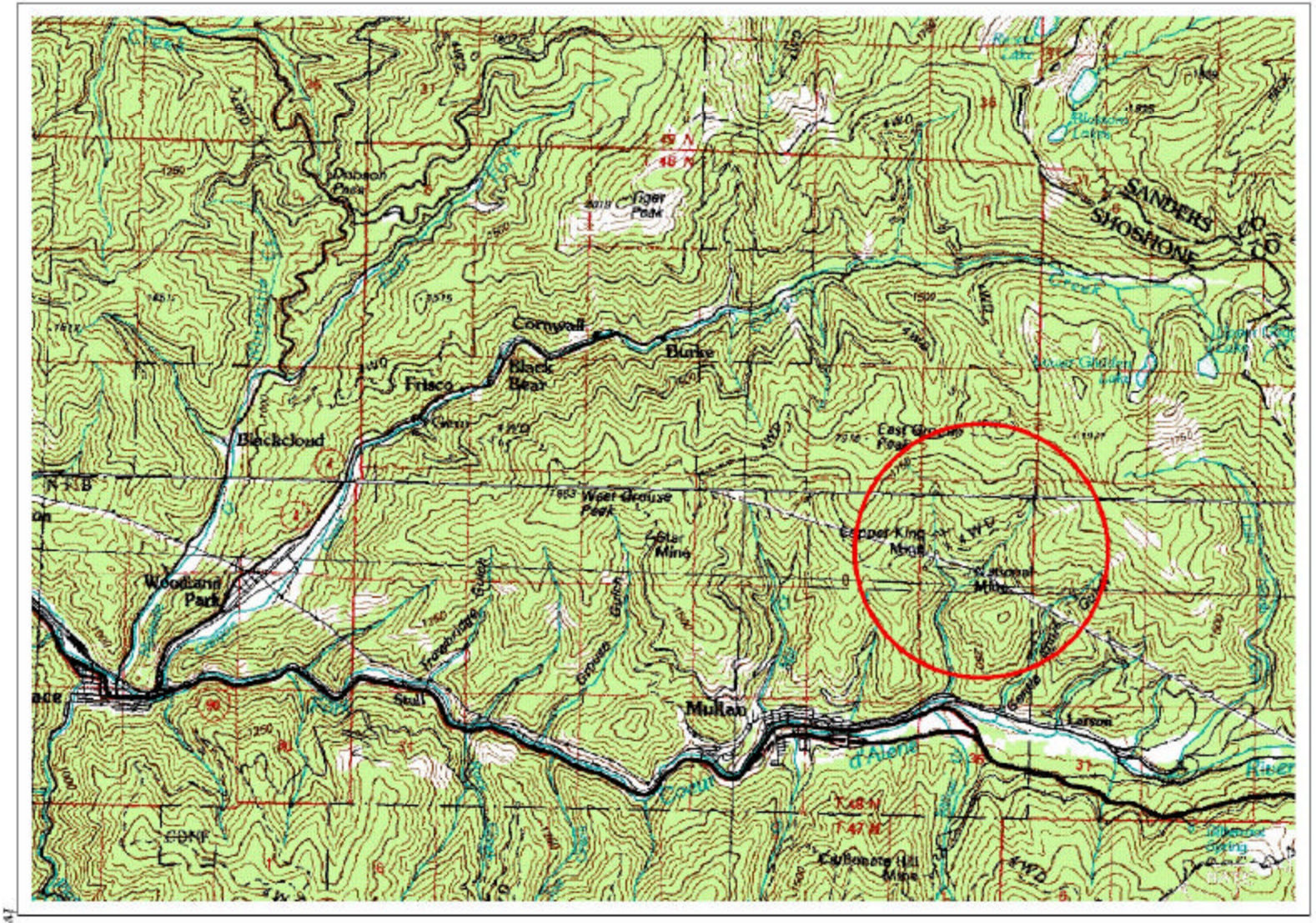
Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the intakes and watershed characteristics.

Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (IDEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. IDEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Figure 1. Geographic Location of Hecla Mining Company, Lucky Friday



Section 2. Conducting the Assessment

General Description of the Source Water Quality

Hecla Mining Company-Lucky Friday Mine water system serves about 170 people who work year round at the Lucky Friday plant. The water system has intakes on the west and main forks of Deadman Creek and in the National Tunnel adit. Water from the three sources is mixed before entering the slow sand filter plant for treatment. The 1860-acre watershed containing the three intakes is north of Interstate 90 about a mile and a half east of Mullan, Idaho.

The primary water quality issue currently facing Hecla Mining Company-Lucky Friday water system is naturally occurring microbial contamination. Antimony and radionuclides have been detected in the water at concentrations below the MCL.

Defining the Zones of Contribution--Delineation

To protect surface water systems from potential contaminants, the EPA required that the entire drainage basin be delineated upstream from the intake to the hydrologic boundary of the drainage basin (U.S. EPA, 1997b). The EPA recognized that an intake on a large water body could have an extensive drainage basin. Therefore, the EPA recommended that large drainage basins be segmented into smaller areas for the purpose of implementing a cost-effective potential contaminant inventory and susceptibility analysis. The delineation process established the physical area around an intake that became the focal point of the assessment. Because the watershed for the Hecla Mining Company-Lucky Friday Mine water system is relatively small, the delineation was not subdivided (Figure 2). The actual data used by IDEQ in determining the source water assessment delineation area are available upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any historical or currently operating facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. Erosion of natural deposits in mineralized areas can also be a source of inorganic chemical contaminants. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of surface water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by IDEQ and from available databases.
The dominant land use in the Deadman Creek Watershed is undeveloped, forested land of mixed public and private ownership. The watershed is crossed by forest roads and contains several inactive mines.

It is important to understand that a release may never occur from a potential source of contamination if best management practices are used. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. When a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. Water system operators are encouraged to work cooperatively with owners of potential contaminant sites. Many owners of such facilities may not even be aware that they are located near a public water supply intake.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted during December of 1998. The first phase involved identifying and documenting potential contaminant sources within the Hecla Mining Company-Lucky Friday Source Water Assessment Area through the use of computer databases and Geographic Information System (GIS) maps developed by IDEQ. The second or enhanced phase of the contaminant inventory involved conducting an on-the-ground identification of potential sources and validation of sources identified in phase one. This task was undertaken with the assistance of Hecla employees.

A total of 12 point source potential contaminant sites are located within the delineated source water area for Hecla-Lucky Friday (see Table 1). They include inactive lead and copper mines, sediment sources such as road cuts and a culvert. Naturally occurring mineralization may be a non-point source of inorganic chemical contaminants.

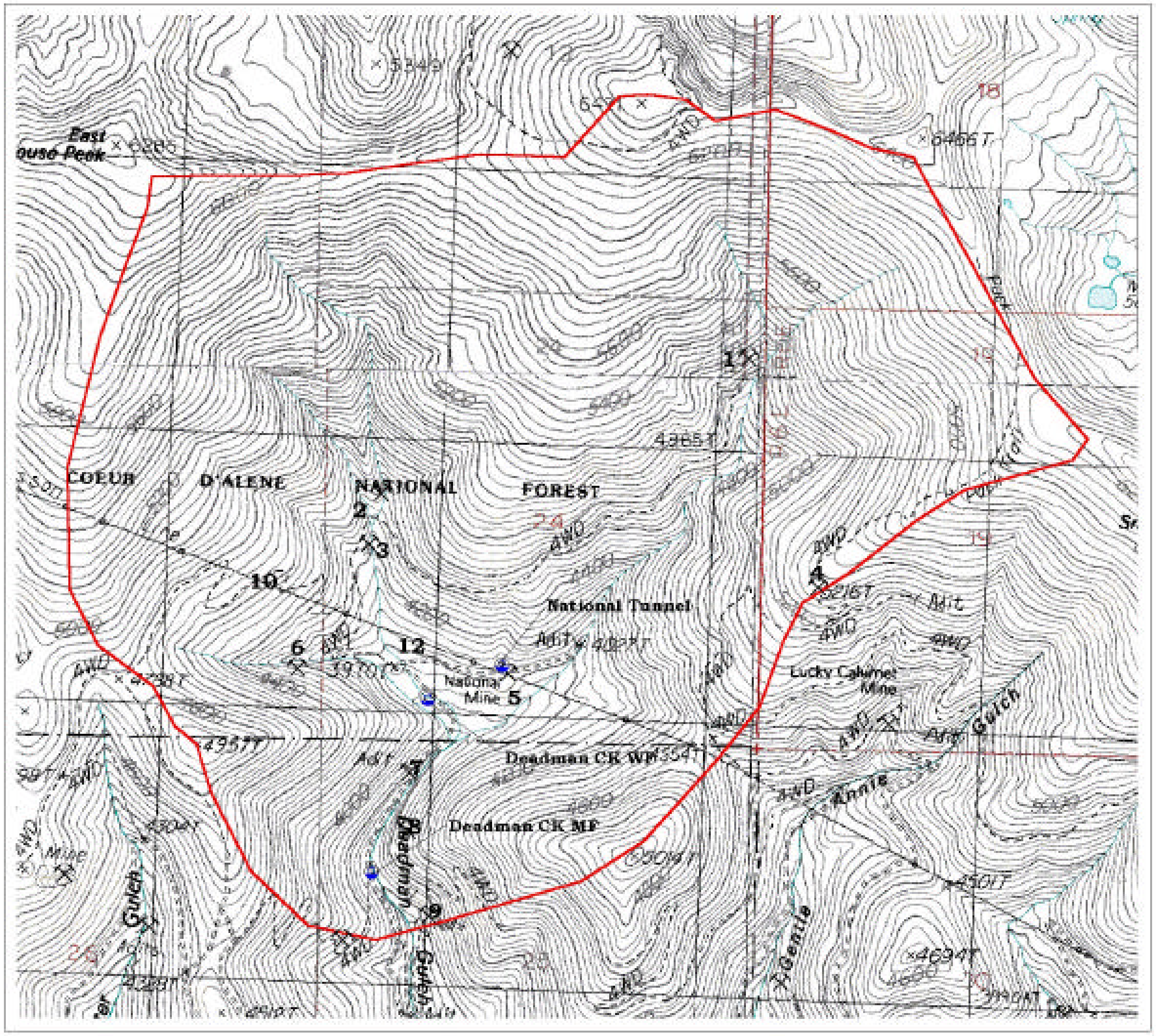


Figure 2
Hecla Mining Company Lucky Friday Deadman Creek Watershed Delineation Map and Contaminant Sources

0 1000 2000 3000 4000 5000 Feet

LEGEND

	Intake		Mine
	Watershed Boundary		Enhanced Inventory Coverage
	Enhanced Inventory		

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Table 1. Hecla Mining Company-Lucky Friday Potential Contaminant Inventory

MAPID	Source Description	Source of Information	Potential Contaminants
1	MINE	Mine database	Lead
2	MINE	Mine database	Lead
3	MINE	Mine database	Lead
4	MINE	Mine database	Copper
5	MINE	Mine database	Silver
6	MINE	Mine database	Lead
7	MINE	Mine database	Lead
8	PROSPECT	Mine database	Lead
9	MINE	Mine database	Lead
10	FOREST ROAD	enhanced inventory	SEDIMENT
11	FOREST ROAD	enhanced inventory	SEDIMENT
12	CULVERT	enhanced inventory	SEDIMENT

Section 3. Susceptibility Analyses

Significant potential sources of contamination were ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity and construction of the intake, land use characteristic, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each intake is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

Intake Construction/ Hydrologic Sensitivity

The intakes in the Hecla Mining Company-Lucky Friday system are located on the west fork and main stem of Deadman Creek and at the National Tunnel adit. Water from the West Fork and the National Tunnel is piped down to the main stem collection box.

The construction of the Hecla Mining Company-Lucky Friday public water system intakes directly affects their ability to protect the water from contaminants. Lower scores for surface intakes imply a system that can better protect the water from debris as it is collected, or provide some filtration prior to treatment. Analyzed as surface water intakes, system construction scores for the West and Middle Forks of Deadman Creek and the National Tunnel adit, were moderate. Sanitary surveys provided information for this portion of the susceptibility analysis.

The analytical model DEQ is using to assess susceptibility of ground water sources emphasizes aquifer protection. Low scores imply a system sited and constructed to protect the aquifer. Scoring is based on construction details and site specific hydrogeological characteristics. Points are added when protective features such as a casing and seal extending to a low permeability unit, or site characteristics such as the presence of a thick clay aquitard, are lacking. Analyzed as a ground water source, the National Tunnel adit got a high system construction score and a high hydrologic sensitivity score. The scoring sheets are included in the attachments. Those interested in a more detailed description of the Susceptibility Analysis process are referred to pages E-44 through E-73 of the *1999 Idaho Source Water Assessment Plan.*

Potential Contaminant Source and Land Use

Based on water sampling results, all three intakes are highly susceptible to microbial contamination. Water from the National Tunnel is mixed with Deadman Creek water prior testing as untreated source water, so a separate determination is not possible with available information.

Mines within 1000 feet of the intakes were discounted as potential sources of inorganic chemical contaminants based on water sampling history and information from the Interior Columbia Basin Ecosystem Management Project *Mining Related Hazard Potential* database. While lead and copper are regulated contaminants, mines in the watershed that produced them were historically small or very small ore producers without acid water production potential. For the lead and copper mines in the Deadman Creek watershed the highest potential chemical hazard to humans, as ranked in the ICBEMP database is 14 on a scale of 0 to 99, with 99 representing the greatest threat.

There are no documented sources of volatile organic Chemicals or synthetic Organic Chemicals in the watershed, so potential contaminant source/land use scores for those classes of contaminants are low.

Table 2. Summary of Hecla Mining Company-Lucky Friday Susceptibility Evaluation

Intake	Contaminant Inventory				System Construction	Hydrologic Sensitivity	**Final Susceptibility Ranking**			
	IOC	VOC	SOC	Microbials			IOC	VOC	SOC	Microbials
Deadman Creek MF	L	L	L	H	M	NA	L	L	L	H
Deadman Creek WF	L	L	L	H	M	NA	L	L	L	H
National Tunnel (as surface water source)	L	L	L	H	M	NA	L	L	L	H
National Tunnel (as ground water source)	L	L	L	H	H	H	M	M	M	H

NA = Not Applicable

H = High Susceptibility, M = Moderate Susceptibility, Low Susceptibility

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

H* - Indicates source automatically scored as high susceptibility due to presence of the contaminant of concern above the Maximum Contaminant Level in the finished drinking water or the presence of significant contaminant sources within 1000 feet of the intake.

Susceptibility Summary

All three intakes ranked highly susceptible to microbial contamination. Susceptibility to inorganic chemical contamination or contamination by volatile organic chemicals or synthetic organic chemicals was low for the surface sources. Analyzed as a ground water source, the National Tunnel Source ranked moderately susceptible to inorganics, synthetic organic and volatile organics because of the weight given hydrologic sensitivity and system construction scores in the ground water susceptibility analysis algorithm relative to potential contaminant source/land use factors.

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. For Hecla Mining Company-Lucky Friday, source water protection activities should focus on implementation of best management practices aimed at reducing sediment runoff on forest roads in the drainage. Since all of the land in the drainage is not owned by Hecla, partnerships with federal, state and local agencies to regulate land use in the watershed should be established and are critical to success. Due to the relatively short time involved with the movement of surface water, source water protection activities should be aimed at short-term management strategies, and at the same time need to address long-term impacts from mining, logging and other land disturbances in the watershed.

Assistance

Public water suppliers and users may call the following IDEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the IDEQ office for preliminary review and comments.

Coeur d'Alene Regional IDEQ Office (208) 769-1422

State IDEQ Office (208) 373-0502

Website: http://www.deq.state.id.us

References Cited

Idaho Department of Agriculture, 1998. Unpublished Data.

Idaho Division of Environmental Quality, 1994. Ground Water and Soils Reconnaissance of the Lower Payette Area, Payette County, Idaho. Ground Water Quality Technical Report No. 5. Idaho Division of Environmental Quality. December 1994.

EPA (U.S. Environmental Protection Agency), 1997, State Methods for Delineating Source Water Protection Areas for Surface Water Supplied Sources of Drinking Water, EPA 816-R-97-008, 40p.

U.S. Government Printing Office, 1995, Code of Federal Regulations, 40 CFR 112, Appendix C-III, Calculation of the Planning Distance

Idaho Division of Environmental Quality, 1999. *Idaho Source Water Assessment Plan.*

Attachment A

Hecla Mining Company-Lucky Friday Susceptibility Analysis Worksheets

The final scores for the surface water intake susceptibility analysis were determined from the addition of the Potential Contaminant Source/Land Use Score and Source Construction Score.

Final Susceptibility Scoring:

0 - 7 Low Susceptibility

8 - 15 Moderate Susceptibility

> 16 High Susceptibility

The final scores for the ground water susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

> 13 High Susceptibility

Surface Water Susceptibility

Public Water System: **HECLA MINING COMPANY**
LUCKY FRIDAY

Source: **DEADMAN CR WF**
DEADMAN CR MF
NATIONAL TUNNEL

Public Water System Number **1400028**

10/30/00 8:39:17 AM

1. System Construction		SCORE			
Intake structure properly constructed	YES	0			
Infiltration gallery or well under the direct influence of surface water	NO	2			
Total System Construction Score		**2**			
2. Potential Contaminant Source / Land Use		IOC Score	VOC Score	SOC Score	Microbial Score
Predominant land use type (land use or cover)	BASALT FLOW, UNDEVELOPED, OTHER	0	0	0	0
Farm chemical use high	NO	0	0	0	
Significant contaminant sources *	YES	Naturally Occurring Microbial			
Sources of class II or III contaminants or microbials	present within the 500' of the intake and the 4 hr time of travel	0	0	0	1
Soils are poorly to moderately drained	NO	0	0	0	0
Three or more contaminant sources	NO	0	0	0	0
Sources of turbidity in the watershed	YES	1	1	1	1
Total Potential Contaminant Source / Land Use Score		**1**	**1**	**1**	**3**
3. Final Susceptibility Source Score		**3**	**3**	**3**	**5**
4. Final Source Ranking		Low	Low	Low	Low

* Special consideration due to significant contaminant

Source is considered High Susceptibility

Ground Water Susceptibility

Public Water System Name : **HECLA MINING COMPANY LUCKY FRIDAY** Source: **NATIONAL TUNNEL**

Public Water System Number : **1400028**

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1. System Construction		SCORE			
Drill Date					
Driller Log Available	NO				
Sanitary Survey (if yes, indicate date of last survey)	YES	1988			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	NO	1			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	YES	0			
Total System Construction Score		**5**			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	NO	1			
Aquitard present with > 50 feet cumulative thickness	NO	2			
Total Hydrologic Score		**6**			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	RANGELAND, WOODLAND, BASALT	0	0	0	0
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	NO	NO	NO	YES
Total Potential Contaminant Source/Land Use Score - Zone 1A		**0**	**0**	**0**	**0**
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	0	0	0	1
(Score = # Sources X 2) 8 Points Maximum		0	0	0	2
Sources of Class II or III leacheable contaminants or Microbials	NO	0	0	0	
4 Points Maximum		0	0	0	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Less Than 25% Agricultural Land	0	0	0	0
Total Potential Contaminant Source / Land Use Score - Zone 1B		**0**	**0**	**0**	**2**
Cumulative Potential Contaminant / Land Use Score		**0**	**0**	**0**	**2**
4. Final Susceptibility Source Score		**11**	**11**	**11**	**12**
5. Final Well Ranking		Moderate	Moderate	Moderate	High

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund@ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.